

REMARKS

In view of the above amendments and the following remarks, reconsideration of the rejections contained in the Office Action of February 13, 2008 is respectfully requested.

In order to make necessary editorial corrections, the entire specification and abstract have been reviewed and revised. No new matter has been added by the revisions. Entry of the substitute specification is thus respectfully requested.

In the outstanding Office Action, the Examiner rejected claims 1-9, 15-16, and 28-30, including independent claims 1 and 28, as being anticipated by the JP '412 reference (Japanese Publication 09-270412); rejected claims 10-14 as being unpatentable over the JP '412 reference in view of the Mertens reference (US 2002/0130106) and the Olgado reference (US 2003/0129850); and rejected claims 17-18 as being unpatentable over the JP '412 reference in view of the Matsukawa reference (USP 5,964,954). However, as indicated above, the original claims have now been cancelled and replaced with new claims 62-97, including new independent claims 62 and 89. All of the new claims read on the elected invention of Group I. Furthermore, for the reasons discussed below, it is respectfully submitted that the new claims are clearly patentable over the prior art of record.

As explained on page 4 of the specification, rollers have been used to hold and rotate a substrate during processing of the substrate. Unfortunately, as explained on page 6, lines 2-7 of the specification, processing fluid such as etching liquid or cleaning liquid tends to collect on the rollers due, at least in part, to the rotation of the substrate. The processing fluid is then scattered due to the rotation of the rollers so as to thereby contaminate the substrate and the environment where the substrate is located. The present invention has been developed in order to address this problem.

A brief discussion of the present invention will now be provided below with reference to various portions of the present application. However, reference to any particular drawings or sections of the specification are provided only for illustrative purposes, and are not intended to otherwise limit the scope of the claims to any specific embodiment.

The substrate processing apparatus of new independent claim 62 comprises a substrate holder including rollers 11 shaped and arranged to hold and rotate a substrate W. Each of the rollers 11 has a circumferential surface and a clamp portion 21 on the circumferential surface, and the clamp portion 21 of each of the rollers 11 is shaped to engage and hold an edge portion of the substrate W. The apparatus further comprises a holder suction unit 24 *operable to suck the fluid from the clamp portion 21 of each of the rollers 11 of the substrate holder* (see page 7, line 32 through page 8, line 10; and page 28, line 9 through page 29, line 1 of the specification; and Figures 2A-2D).

The advantages of the apparatus as recited in new independent claim 62 are illustrated in Figures 3A and 3B, and described on page 32, line 21 through page 33, line 4 of the specification. In particular, as illustrated in Figure 3A, processing liquid D which remains on a peripheral portion of a substrate W held by the rollers 11 will be transferred to the clamp portion 21 of the rollers 11, as indicated by reference letter D'. The residual processing liquid transferred to the roller 11 will remain on the clamp portion as shown by reference letter D", and may subsequently contaminate another substrate or the substrate environment. However, as illustrated in Figure 3B, the holder suction unit 24 of the present invention sucks the fluid D" from the clamp portion 21 of each of the rollers 11. Therefore, contamination of a substrate or the substrate environment can be prevented.

The JP '412 reference teaches a cleaning device and method, and the Examiner asserted that this reference teaches a holder suction unit 24 for sucking the fluid from the substrate holder and substrate, as illustrated in Figures 1 and 2. However, as clearly illustrated in Figure 2 of the JP '412 reference, the substrate holder does not include *rollers* for holding and rotating a substrate. Instead, the substrate holder of the JP '412 reference comprises several "pins" for contacting and holding a wafer 3 (see paragraph [0031]). Thus, it follows that the JP '412 reference also does not teach or suggest rollers each having a clamp portion, or a holder suction unit *operable to suck the fluid from the clamp portion of each of the rollers*. Consequently, it is respectfully submitted that the JP '412 reference does not anticipate new independent claim 62.

In addition, it is noted that rollers have unique characteristics which require solutions different from holding devices such as the “pins” of the JP ‘412 reference. In particular, the rollers contact the substrate around an entire circumferential surface of each of the rollers during the holding and rotating process. As a result, the processing liquid is applied to the rollers around the entire circumferential surface thereof, and this processing liquid is easily sprayed throughout the environment of the substrate due to the rotation of the rollers. These particular problems do not exist with the relatively sedentary “pins” of the substrate holder in the JP ‘412 reference. Due to these significant differences, it is submitted that the JP ‘412 reference does not even offer a suggestion for providing a holder suction unit operable to suck fluid from a clamp portion of each roller of a substrate holder, as recited in new independent claim 62. Accordingly, it is respectfully submitted that the JP ‘412 reference also does not render independent claim 62 obvious.

Furthermore, the Mertens reference, the Olgado reference, and the Matsukawa reference also do not teach or suggest a holder suction unit operable to suck fluid from a clamp portion of each roller of a substrate holder. Therefore, these references provide no reason to modify the JP ‘412 reference so as to obtain the invention recited in new independent claim 62. Accordingly, it is respectfully submitted that new independent claim 62 and the claims that depend therefrom are clearly patentable over the prior art of record.

New independent claim 89 is directed to a substrate processing method that comprises holding a substrate using rollers, in which each of the rollers has a clamp portion on the circumferential surface. The clamp portion is shaped to engage and hold an edge portion of the substrate. The substrate is rotated by rotating the rollers of the substrate holder, and fluid is supplied to the substrate while the substrate is being rotated. The fluid which has been transferred from the substrate to the clamp portion of each of the rollers is sucked, and *the sucking is performed by a holder suction unit located adjacent to the clamped portion of each of the rollers of the substrate holder.*

As noted above, new independent method claim 89 recites features similar to the features of new independent apparatus claim 62, and therefore achieves similar advantages. For the

reasons discussed above with respect to new independent apparatus claim 62, it is respectfully submitted that the prior art of record does not anticipate or even render obvious new independent method claim 89. Accordingly, it is respectfully submitted that new independent method claim 89 and the claims that depend therefrom are clearly patentable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. However, if the Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact the Applicant's undersigned representative.

Respectfully submitted,

Kaoru YAMADA et al

By: 

W. Douglas Hahm

Registration No. 44,142

Attorney for Applicants

WDH/akl
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
May 13, 2008